ASTI ENVIRONMENTAL

Investigation • Remediation
Compliance • Restoration

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SENT VIA EMAIL ONLY

February 28, 2017

Ms. Laura Evans
EPA - Region 5
77 West Jackson Blvd., G-17J
Chicago, IL 60604-3507

Re: Lake St. Clair Coastal Marshland Restoration GL00E00646
Amendment to Final Report for 2016 Work

Dear Ms. Evans:

In 2010, Macomb County was awarded a Great Lakes Restoration Initiative grant to restore approximately 400 acres of Great Lakes coastal marsh at Lake St. Clair Metropark in Harrison Township, Michigan. The project team consisted of Macomb County Department of Planning, Huron-Clinton Metropolitan Authority, the Clinton River Watershed Council, Wayne State University, and Oakland University. ASTI Environmental was contracted by Macomb County to manage the restoration project.

The project was granted several time extensions that took the project through 2015. In 2016, the EPA provided Macomb County a final extension of one additional year to complete the scheduled restoration activities. These activities focused on educational/recreational improvements and the continuation of invasive species control throughout the project area. As of the end of 2016, all anticipated project activities have been completed and nearly all of the awarded funds spent.

Summary of Restoration Activities
During the course of the project, the following activities were completed:

Restoration Activities

- Invasive species (*Phragmites australis* and *Typha angustifolia*) were treated with aerial (helicopter) spraying, mowing; follow-up spot control chemical treatment spraying occurred several times over the course of project duration, including in 2016.
- In 2013 and 2016, invasive shrubs were hand cut and removed from the cottonwood swamp; cut stumps were chemically treated to deter regrowth.
- In 2016, invasive shrubs were removed from the majority of the project area.
- In 2016, flowering rush (*Butomus umbellatus*) and Canada thistle (*Cirsium*

arvense) were treated throughout the project area.
- Two water control structures were placed along the maintenance road to allow water from the northern part of Point Rosa Marsh to flow more freely into the southern part of Point Rosa Marsh and eventually reach Lake St. Clair.
- A new flap gate was installed along Cherry Lane to bring water back into the marsh from the roadside ditch that was by-passing the marsh completely.
- *Lyngbya* algal mats were removed from the natural beach shoreline.
- Spoil piles were removed from the marsh.
- Water level transducers were purchased and installed throughout the marsh to track water levels on a daily basis.

Habitat Improvements
- Four snake hibernacula were constructed.
- Basking logs were placed within marsh for herpetofauna and birds.
- Turtle nesting areas were constructed.
- A shallow, permanent, open water pond was created for wildlife.
- 25 tern nesting platforms were installed in Black Creek Marsh.

Recreation/Education Enhancements
- A boardwalk was constructed through Point Rosa to allow visitors to experience the interior of the marsh. The boardwalk has benches and interpretive signage.
- A viewing platform was constructed at a natural high point to showcase the marsh and its connection to Lake St. Clair. The platform has a seating area, interpretive signage, and viewing scopes.
- A new pathway was built that connects the parking lot to the boardwalk and the viewing platform.
- Much of the debris and riprap along the high bluffs of the Lake St. Clair shoreline was cleaned up, and the view to the Lake was cleared. Native short-grass prairie was planted along the shoreline to enhance habitat in this area while still providing for recreational viewing.
- Trail cameras were purchased and installed to view wildlife and track visitor usage.
- In 2016, trails were improved for accessibility.
- In 2016, a dipping platform was constructed in Point Rosa Marsh to allow school groups to easily and safely access the wetland for water sampling.
- In 2016, kayaks and additional bird banding nets were purchased for education and monitoring.

The attached updated Project Plan shows the location of all of the activities that occurred during the course of the restoration project, including those made in 2016 with the final extension.

Success Metrics

The project exceeded the metrics laid out in the GLAS reporting system. At least 485 acres of wetland and immediately adjacent uplands were restored or improved during the course of this project.

Table 1. Quantifiable Measurement per GLAS Reporting System Update:

	Numeric Amount	Unit	Description
GLRI Action Plan Measure of Progress	400	acres	400 acres of coastal wetlands are to be restored for this project
Final Measure of Progress	485	acres	Number of acres of wetlands and wetland-associated uplands protected, restored and enhanced

Data Collected, Summary and Recommendations

The project funded pre- and post-restoration monitoring of the following categories:

- Birds
- Herpetofauna
- Vegetation
- Water Quality

Individual reports generated by the group or individual responsible for each category were provided previously, but is also summarized in the following table:

Table 2. Summary of Pre- vs. Post-Restoration Monitoring

Category	Summary
Birds	Bird banding efforts (spring and fall) reveal both an increase in the number of total birds and the number of species captured for banding between 2010 (pre-restoration) and 2013 (post-restoration). However, the total effort (hours) for surveying increased during this period, as well, so some of the increase in bird numbers and species can be attributed to increased effort. Regardless, it should be noted that Nature Center staff indicate that they are seeing least bitterns (state threatened), green herons, marsh wren (state special concern) and moorhens (state threatened) in numbers that they have not witnessed in many years. The return of the moorhens has been particularly welcomed by staff and is attributed to the increased number of open water pockets within the marsh that resulted from the hydrological improvements and *Phragmites* removal.
Herpetofauna	No significant increase in species or numbers of herpetofauna was reported; however, the number of survey manhours was significantly lower in the post-restoration surveys. Notable species found during the surveys include Butler's garter snake, Blanding's turtle (state special concern), mudpuppy, and Eastern fox snake (state threatened). The immediate response of herpetofauna using the newly installed habitat structures was notable. In addition, the researchers noticed an increase in the number of breeding sites (beyond just within the created habitat) and more even dispersal per location post-restoration.

Vegetation	Following restoration, an initial decrease was seen in both species richness and floristic quality index (FQI) of vegetative communities. However, in the two years following this initial decrease, species richness and FQI increased each year.
Water Quality	Inconclusive, incomplete data

ASTI recommends continuing the long-term monitoring of the same parameters, to track the success of the restoration efforts over time. However, vegetation and water quality may be the most useful long-term data and should be the priority. The Huron-Clinton Metropolitan Authority continues to fund monitoring of bird and herpetofauna utilization. In addition, HCMA in collaboration with Macomb Community College, Macomb County, and Wayne State University is in the process of development of a field research and educational collaborative called the Huron to Erie Alliance for Research and Training (HEART) Freshwater Center. The Center will focus on the St. Clair River, Lake St. Clair, the Detroit River and western Lake Erie, with areas of study including water research in traditional and emerging areas of storm water runoff (green infrastructure), beach health, wetland ecology and marsh restoration, invasive species, algae and nuisance vegetation, fisheries-related research, and emerging contaminants in urban waterways. It is anticipated that the HEART Center will aid greatly in long-term monitoring of the Black Creek Marsh coastal wetlands.

Specific recommendations for further habitat enhancement for each of the faunal groups can be found in the Management Plan, sent to you in a previous correspondence.

Research and Educational Activities

The project funded master's thesis research projects for two students and a poster presentation for an undergraduate student:

- Effects of varying inundation regimes on the decomposition of *Phragmites australis* and *Typha angustifolia* – Master's Thesis, Anita Baxter, Oakland University
- Effects of *Phragmites australis* litter cover on seed germination – Master's Thesis, Travis White, Wayne State University
- Riprap Alters the Structure and Function of Lake St. Clair Shorelines – Stacey Wensink and Scott Tiegs, Oakland University - Poster for JASM, 2014

This project was presented at the following conferences and events:

- Lake St. Clair Binational Conference – 2012
- Wayne State University – Hydrology Class – 2013
- Michigan Sea Grant Lunch and Learn – 2013
- Clinton River Watershed Council Annual Meeting – 2013
- Clinton River AOC PAC Meeting - 2013
- Michigan Wetlands Association - 2014

The project also funded, at least in part, the following educational activities:

- Living Along the Water, presentation to local residents, 2013
- MEECS Teacher Workshop – Wetlands and Water Quality, 2013
- Voyager Canoe Trips Through Marsh, 2011-2013
- Stormwater Awareness/Wetland Awareness Display, several different events where displayed, 2013
- Stormwater Curriculum Packet, MEECS Workshop, 2013
- Interpretive Outdoor Signage, 2013

Long-Term Management Plan

In order to ensure the long-term management of the marsh, a Management Plan was written by ASTI Environmental in collaboration with the Huron-Clinton Metropolitan Authority, in order to memorialize the intent of this restoration project, to document project activities, and to provide a single location for the rationale for the specific activities that were accomplished as part of the project. This Management Plan can be used as a restoration maintenance manual with the intent that it will be used by any and all future park staff for long-term management, maintenance, and planning. This plan was sent to you in a previous correspondence.

Awards

The project was awarded the Presidential Award from Keep Michigan Beautiful (2013) and an American Society of Landscape Architects Merit Award (2014).

Public Response

The response from the public has been overwhelmingly positive. The restored wetlands are attracting birders from all over the region. Lake St. Clair Metropark has become a birding hot spot, upon completion of the restoration activities. On most days, a trip to the marsh will provide opportunities to view marsh wren, green heron, bitterns, and moorhens, as well as many other special wetland bird species.

The boardwalk through the marsh allows park visitors to experience the marsh and see the wildlife without having to be a hard core nature enthusiast, donning a set of waders. The park's Nature Center staff are delighted at the increased ability to share nature and the outdoor experience with people of all ages and abilities. They have also witnessed a return of many species to the marsh that they have not seen in years, both in terms of flora and fauna.

If you have any questions or comments, please do not hesitate to call me at **800.395.ASTI**. We greatly appreciate the opportunity to work with you on this project.

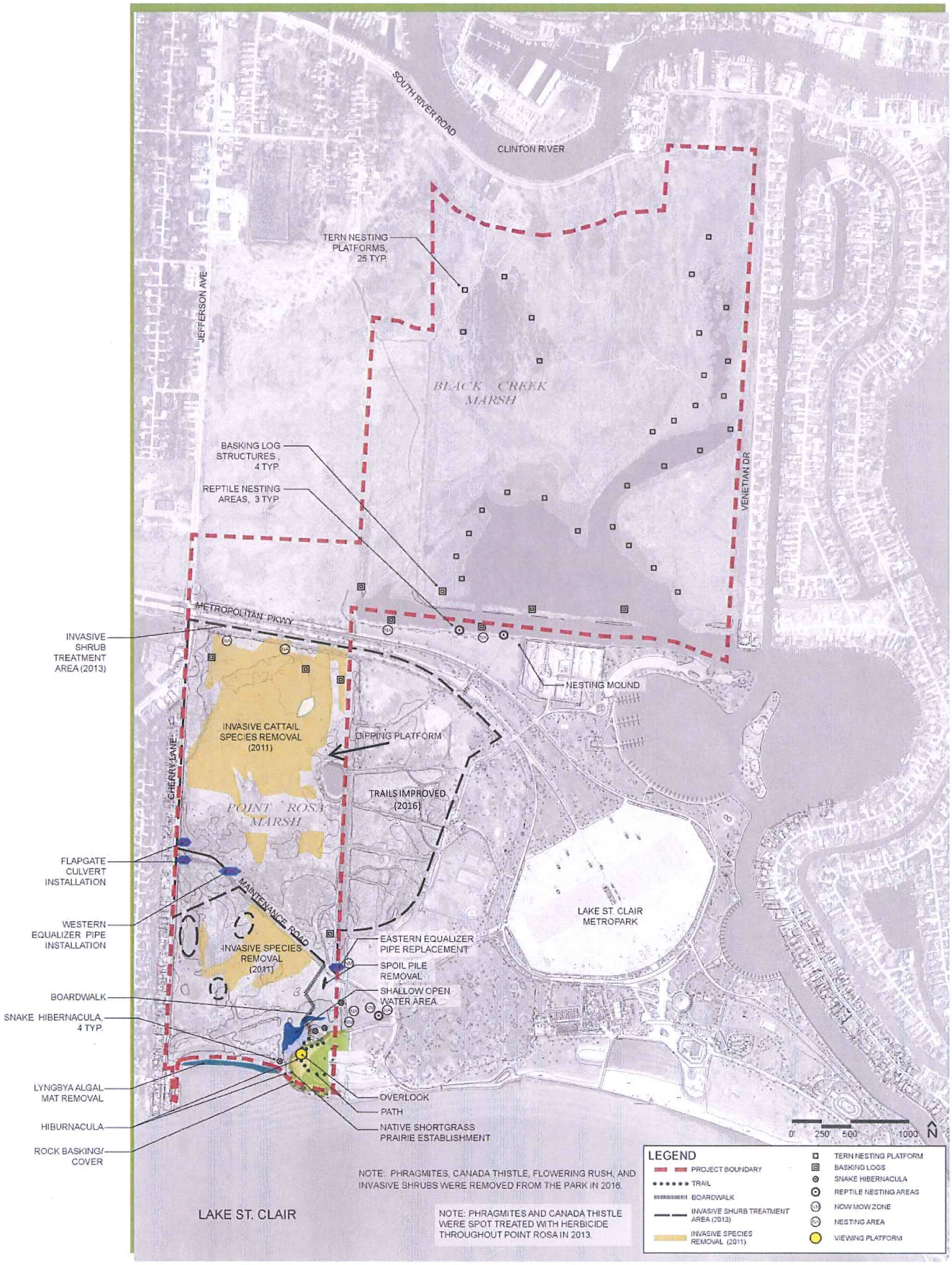
Sincerely yours,

ASTI ENVIRONMENTAL

Dianne C. Martin
Vice President
Professional Wetland Scientist #1313

cc. Gerald Santoro, Macomb County

Attachments: Updated Project Plan
Photo Log of 2016 Work



Project Plan

DECEMBER 2016

ASTI Environmental / Hamilton Anderson / Applied Science, Inc.

Lake St. Clair Metropark

PHOTO LOG

Lake St. Clair Metropark, Harrison Township, Michigan

Photo 1. Newly resurfaced pathway

Photo 2. Pathway re-surfacing

Photo 3. Improved pathways

PHOTO LOG

Lake St. Clair Metropark, Harrison Township, Michigan

Photo 4. The new dipping platform

Photo 5. Dipping platform for school groups to use to access the water for water quality and macroinvertebrate sampling

Photo 6. Dipping platform

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